

Patent claims

1. An arrangement (1)  
comprising a component (2) and at least one monitoring  
5 device (3) for recording degradation (5) in the  
component (2),  
in which the monitoring device (3) has at least one  
electrically conductive monitoring structure (4) which  
is decoupled from a function of the component and has a  
10 defined electrical property, and  
in which the component (2) and the monitoring structure  
(4) are fixedly connected to one another in such a  
manner  
that the degradation (5) of the component (2) causes  
15 degradation (17) of the monitoring structure (4) and  
therefore a change in the defined electrical property  
of the monitoring structure (4),  
  
characterized in that  
20 the monitoring device (3) and the monitoring structure  
(4) are not permanently electrically connected to one  
another.
- 25 2. The arrangement as claimed in claim 1, in which  
the degradation (5) of the component and/or the  
degradation (17) of the monitoring structure is  
selected from the group consisting of deformation  
and/or removal of material and/or crack formation  
30 and/or crack propagation.
3. The arrangement as claimed in claim 1 or 2, in  
which the monitoring structure (4) has at least one  
electrical resonant circuit (7).

4. The arrangement as claimed in one of claims 1 to 3, in which the monitoring structure (4) includes at least one electrically conductive conductor material  
5 selected from the group consisting of metallic conductors and/or ceramic conductors.

5. The arrangement as claimed in claim 4, in which a component material of the component and the conductor  
10 material of the monitoring structure have a substantially identical mechanical property.

6. The arrangement as claimed in claim 5, in which the mechanical property is selected at least from the  
15 group consisting of thermal expansion behavior and/or fracture toughness.

7. The arrangement as claimed in one of claims 1 to 6, in which the monitoring structure (4) is arranged at  
20 a surface portion (10) of the component (2) and/or in the volume of the component (2).

8. The arrangement as claimed in one of claims 1 to 7, in which the component (2) is a heat shield of a  
25 combustion chamber.

9. The arrangement as claimed in claim 8, in which the monitoring structure (4) is arranged at a surface  
portion (10) of the heat shield (2) which is remote  
30 from an interior space (6) of the combustion chamber.

10. A process for producing the arrangement as claimed in one of claims 1 to 9, comprising the process steps of:

- a) arranging the component (2) and the monitoring structure (4) against one another, and
- b) fixedly connecting the component and the monitoring structure (4),
- c) providing a monitoring device (3) which is not permanently electrically connected to the monitoring device (4).

11. The process as claimed in claim 10, in which a ceramic is used as component material of the component and/or as conductor material of the monitoring structure, and joint sintering of the component and the monitoring structure is carried out to fixedly connect the component and the monitoring structure.

12. A method for checking the ability of a component (1) to function using the arrangement as claimed in one of claims 1 to 9, comprising the method steps of:

- a) determining an actual value of at least one defined electrical property of the monitoring structure (4) by means of the monitoring device (3), with an electrical or electromagnetic coupling being produced between monitoring structure (4) and monitoring device (3),
- b) comparing the actual value of the electrical property with a desired value, representing the ability of the component (1) to function, of the electrical property.

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13. The method as claimed in claim 12, in which the defined electrical property of the monitoring structure is selected from the group consisting of DC resistance and/or impedance and/or radiofrequency resonance  
5 property.

14. The method as claimed in claim 12 or 13, in which the determination of the actual value of the defined electrical property is carried out in an operating  
10 phase of the component and/or in a stationary phase of the component.